

## Jack Strut Stabilizer

### BACKGROUND OF THE INVENTION

5 The invention relates to pick up truck campers and more particular the jacking systems that level and support the camping unit when it is off loaded or removed from the bed of the pick up truck or host vehicle.

Since the early 1950s camping has been an ever growing sport among families throughout the United States and the world. As a vacation form and as an industry, it has  
10 experienced vast growth spawning many variations and configurations of camping vehicles and requiring an ever-increasing need for more and more campgrounds.

There are many types of family style camping units on the market today ranging from simple tents to trailer type fold out units, pick up truck campers and the more sophisticated 5<sup>th</sup> wheel type trailers that are towed behind pick up trucks in very much the  
15 same manner as the large cross country semi tractor trailer rigs. Motor homes are another form of camper that is becoming more prevalent on America's roads and campgrounds. Although there are many styles and sizes of camping vehicles as outlined above they all have a similar inherent problem. While being driven or towed on the roads and highways, they require some sort of suspension system to insure a smooth ride and proper handling,  
20 but while parked in the campsite this same suspension allows the camper to wobble and sway as the inhabitants move about inside. It is therefore, usually desirable to lock out the suspension system by blocking up or placing jack stands under the frame minimizing this

unwanted motion while the camping units are parked. In the case of pick up truck campers, the springs of the host vehicle itself provides the suspension needed for highway driving. However, when the camper is positioned on the campsite the rocking or movement of the truck and camper due to the inhabitants moving around inside is usually considered quite annoying.

A number of attempts have been developed and employed to provide solutions to this problem of unwanted motion. Wilson's "Fifth Wheel Stabilizer" US Patent No. 4,905,953 is a good example. Although this patent clearly addresses the specific problem of swing and sway or wobble in camper units as we have outlined, the invention is basically restricted to Fifth wheel style campers or units with a similar geometric configuration. DeJager's US Patent No. 4,429,851 has also recognized the need to stabilize mobile structures however the invention outlined is of a substantially more permanent nature and does not really lend itself to a camper application or address the problems as outlined here-in. A 1965 Patent No. 3,186,570 outlines N.E. Brunnels "Camping body loading and unloading device". Although this patent certainly addresses the "swing and Sway" problem, it involves a jack support system substantially more complex than the easily attached stabilizer unit outlined in the present invention.

Most modern camping units are fitted or offer as an option, integral leveling jack stands on each of the four corners of the unit designed to not only level the camper but transfer the weight of the vehicle from the suspension system to the rigid jacks for the purpose of eliminating the rocking motion caused by the inhabitants inside. This system works well on many of the previously mentioned camper units such as trailer type campers, 5<sup>th</sup> wheel units and the self propelled motor home or bus type campers, because they are normally

designed with a fairly low center of gravity where the under carriage of the units are close to the ground allowing for relatively short leveling or jack supports or in some cases, simple blocking up with wood blocks.

- 5 Pick up truck campers however are somewhat unique in that in order to achieve the same stability as well as aid in the loading and off-loading of the camper unit from the pick up truck, they require a more specialized system. In reference to the physical characteristics of pick up truck campers, they are most commonly designed with an overhang in the back for entry to the camper. Aside from the narrow floor area, which is the portion of the
- 10 camper unit that sets down into the pick up truck bed, the overhang area is the only part of the unit that is situated close to the ground with a low center of gravity. Shelves which extend above and out over the pick up truck bed sides used for gear stowage, and the structure which extends out forward and above the truck cab providing the sleeping area account for the majority of the overall volume of the unit which causes the camper to
- 15 have the previously mentioned high center of gravity which is not conducive to good stability. While the camper remains in place on the host vehicle, with the vehicle continuing to support the primary weight of the camper unit, the jack stands mounted to each of the campers four corners can simply be lowered to the ground surface to a point where they relieve some of the load from the host vehicle virtually eliminating the
- 20 rocking and swaying of the camper unit while in use. When the camper is off loaded from the bed of the pick up truck, which is commonly the case in camping situations and the entire load of the camper is supported by the jack stands, the jacking and leveling apparatus designed for these units is required to be considerably more substantial than the

supports used on any of the other style camper previously mentioned. This is primarily due to the extended length of the support jacks required for off loading a pick up truck style camper, Pick up truck camper jacks are often battery powered, larger in diameter, and required to be longer especially on the forward end where they are mounted on the previously mentioned shelf which can be from 36" to 48" off the ground. The required extended length of these forward jack stands also contributes to their tendency to flex more at their attachment point to the camper body resulting in fatigue. It is therefore required that they be attached to the camper corner structure in a permanent or much more secure manner and that provisions be implemented to reduce this flexing as much as possible.

## SUMMARY OF THE INVENTION

According to the present invention, an adjustable length, quick disconnect jack strut  
5 stabilizing unit is provided for the purpose of stiffening an extended pick up truck camper  
jack support thus virtually eliminating movement between the jack strut and the body of a  
pick up truck camper unit. The proposed invention is comprised of two lengths of square  
steel tubing arranged one inside the other forming a telescoping member with variable  
length capability and a means for locking the two telescoping members to a specified  
10 length. A clamping ring attached to one end of the telescoping member is arranged for  
pivotally mating one end of the jack strut stabilizer unit to the lower part of a pick up  
truck camper jack strut. When not in use, the stabilizer unit is pivoted up and stowed  
along side and secured to the jack stand. The opposite end of the jack strut stabilizing unit  
is provided for with a means for quick and simple attachment to an anchor plate, which is  
15 permanently placed on the camper body at a predetermined location. Thus when the  
stabilizing unit is swung away from it's stowed position, it's opposite end connected to  
the anchor plate on the camper body and the telescoping tube sections locked to length,  
the jack strut stabilizing unit creates a cross bracing geometry between the camper body  
and the camper's jack strut, substantially reducing or eliminating the swaying motion and  
20 wobble created by the normal flexing of the extended jack struts when the camper unit  
off loaded from the pick up truck bed and occupied.

In the preferred embodiment, the stabilizing units of the present invention are mounted to  
the two forward camper jack struts utilizing a clamping ring. Stabilizing units could also

be mounted to the rear two camper jack stands if their extended length warranted. The stabilizer unit is pivotally attached to the clamping ring in a manner that allows it to be folded to an upright position parallel and directly adjacent to the camper's jack strut for stowage or when not in use. Provision is made for containment of the jack strut in the

5 stowed position with a length of webbing strap fitted with a Velcro material which is fixed to the stabilizer unit and can be secured around a the camper's jack strut. In the process of off loading the camper from the truck it is necessary to extend each of the two forward and two back jack struts mounted to the camper; substantially transferring the load from the pick up truck to the four jack struts. At this point, the truck can be driven

10 out from beneath the camper leaving it supported on the jack struts. After raising or lowering individual struts to achieve the desired height of the camper off the ground and level the camper unit, The Velcro retaining straps on the stabilizer braces are removed from the jack struts, the units are pivoted downwards, the telescoping lock devices on the stabilizer units are loosened and the units are telescoped out to the point where they can

15 be mated to the previously mounted anchor plate on the camper body. The locking devices are then tightened fixing the length of the stabilizing units and forming the structural cross tie between the jack struts and the camper body minimizing movement and flexing of the camper jack struts.

## BRIEF DESCRIPTION OF THE DRAWINGS

The above summary and description as well as other objects features and advantages of the present invention will be more fully appreciated by reference to the detailed description of the preferred embodiments in accordance with the present invention when taken in conjunction with the accompanying drawings, wherein

FIG 1 shows an exploded view of stabilizer unit according to the present invention

FIG 1a shows locking knob details

FIG 2 shows detailed components of the Web strap

FIG 2a shows a top view detail of web strap , camper jack and stabilizer unit in stowed position

FIG 3 shows an elevation view of the round clamp and inside tube connection

FIG 4 shows a front and side view of the anchor plate and fasteners

FIG 5 shows a front view of stabilizer unit mounted to camper

## DETAILED DESCRIPTION

Referring now to **FIG. 1** stabilizer unit **10** according to the present invention comprises a cross tying brace provided for the purpose of limiting the flexing between a pick up truck camper and it's support jacks by structurally tying or mechanically linking the camper jack struts to the main camper body by triangulating the load forces. Stabilizer unit **10** being comprised of an outside tube **11**, inside tube **35**, locking device **21**, anchor plate **48**, round clamp **44** and web strap **27**.

Outside tube **11** of stabilizer **10** to be fabricated from 1" square steel tubing approximately 18" in length. Outside tube **11** to have a squared end **12**, and a second exposed end herein referred to as angled end **13**, a face **14**, a back **15** and two parallel sides **16**. Relief angle **17** is provided on angled end **13** for the purpose of establishing clearance for easy installation and removal of clip **58** from pin **51** when hole **18** on angle end **13** in back **15** of outside tube **11** is placed over pin **51** mating outside tube **11** to anchoring device herein referred to as anchor plate **48** on camper **1**. Angle **17** on angled end **13** of outside tube **11** to be approximately 60 degrees formed by removing material from parallel sides **16** of angled end **13**. Tab **19** is welded to face **14** of outside tube **11** for the purpose of adding thickness and increase the effective threading depth of threaded hole **20** in outside tube **11**. Tab **19** and wall section of outside tube **11** to be thru drilled and threaded to accommodate threaded bolt portion **22** of locking device **21**. Tab **19** to be fabricated of 1/8<sup>th</sup> thick mild steel approximately 5/8 inches wide and 1" long. Tab **19** to be positioned approximately 1" from squared end **12** of outside tube **11** and substantially



welded to face **14** of outside tube **11**. Locking device **21** is provided for locking Outside tube **11** to inside tube **35** thus fixing the desired length of stabilizer unit **10** subsequent to mating hole **18** of outside tube **11** to pin **51** on anchor plate **48**. Locking device **21** is comprised of threaded bolt portion **22** approximately 1" long, and a knob **23**

5 approximately 1.125" in diameter. Locking length of stabilizer unit **10** is accomplished by turning knob **23** and threaded bolt portion **22** of locking device **21** in a clockwise direction which results in substantial contact between end of threaded bolt portion **22** of locking device **21** and side surface **40** of inside tube **35** substantially limiting sliding movement between outside tube **11** and inside tube **35**. Referring now to **FIG 1a**.

10 Retaining cable **24** , approximately 3" long is provided to keep from loosening locking knob **23**. Retaining cable **24** to be arranged with a small loop at either end here in referred to as loop **(a)** and loop **(b)**. Loop **(a)** to be formed at one end of retaining cable **24** utilizing a standard micropress type sleeve. Loop **(a)** to be of a diameter to allow retaining cable **24** to be pivotally connected to center of knob **23** on locking device **21**. Pivotal

15 connection to be provided thru use of spacer **(c)** which maintains clearance for loop **(a)** between flat head screw type fastener **(d)** and the surface of knob **23** when fastener **(d)** passes thru spacer **(c)** and is threaded into threaded hole **(e)** in center of knob **23**. Loop **(b)** to be formed at the opposite end of retaining cable **24** utilizing a standard micropress type sleeve. Loop **(b)** to be smaller in diameter and not requiring pivotal mounting is

20 secured to plate **19** approximately at point **25** utilizing small screw **26**. Referring now to **FIG 2** and **FIG.2a** Strap **27** is provided for the purpose of securing stabilizer unit **10** to camper jack stand **5** when stabilizer **10** is not being used as shown in dotted lines (**35s**) in (fig.5). Web strap **27** is comprised of a length of web strapping approximately 15" long

and 1" wide having an inside surface **28** , an outside surface **29**, and a strap slide **30** substantially fixed to one end. Web strap **27** outside surface **29** to be provided for with two mating components of Velcro strips **31** substantially fastened to the end opposite strap slide **30** on outside surface **29** of web strap **27**. (The exact spacing of Velcro strips

5 **31** will be determined be the diameter of camper jack **5**.) Referencing now **FIG.2a** showing Velcro strips **31** positioned on outside surface **29** of web strap **27** in a manner allowing for end of strap **27** to be passed around camper jack **5** when stabilizer unit **10** is in the stowed **35s** position (see fig.5), passed through strap slide **30** then folded back to position where in first Velcro strip **31** component can be pressed on to second Velcro

10 strip **31** component, securing stabilizer unit **10** in a position adjacent and parallel to camper jack **5**. Referring again to **FIG 2**. Web strap **27** to be provided for with two mounting holes **32** through web strap **27**. Holes **32** to be located approximately 2 ½ " from strap slide **30** end of web strap **27** and provide for substantial mounting of web strap **27** to outside tube **11**. Web strap **27** to be secured with rivets **34** and washers **33** to side

15 **16** of outside tube **11**. Web strap **27** to be attached to outside tube **11** where by holes **32** of web strap **27** intersect with longitudinal dimension of outside tube **11** at right angles and at a point on outside tube **11** approximately 2.5" from angle end **13** of outside tube **11** measured from back **15** surface of outside tube **11**.

Referring again to **FIG.1**. Inside tube **35** provides geometry allowing for sliding fit

20 between inside tube **35** and outside tube **11** providing stabilizer unit **10** with telescoping variable length capability. Inside tube **35** comprised of ¾"square steel tubing approximately 18" long.

Inside tube **35** to be provided for with one squared end **36** and a first exposed end herein referred to as radius end **37**, a front surface **38**, a back surface **39** and two identical side surfaces **40**. Radius at end **37** of inside tube **35** to measure approximately  $3/8$ " provides clearance between end **37** of inside tube **35** and camper jack **5** when inside tube **35** is attached to the mounting bracket herein referred to as round clamp **44**. Clearance allows stabilizer unit **10** to be rotated from stowed **35s** position to in use position **35** without interference between end **37** and outside diameter of camper jack **5** (see fig.5 ). Side surfaces **40** of inside tube **35** to be provided for with two approximately  $3/8$ " diameter holes **41** at radius end **37**. Holes **41** provided to accommodate swivel bolt **42** when round clamp **44** is attached to radius end **37** of inside tube **35**. Moderate torque application of lock nut **43** to swivel bolt **42** insures rotational capability of round clamp **44** when attached to radius end **37** of inside tube **35**.

Continuing reference to **FIG.1** Round clamp **44** is provided for pivotal attachment of inside tube **35** of stabilizer unit **10** to camper jack **5** on camper **1**. Round clamp **44** to be generally circular in shape, fabricated of  $1/8^{\text{th}}$  " thick mild steel flat stock approximately 1" wide. Round clamp **44** to be formed into a partial ring with an inside diameter of approximately  $2\frac{1}{4}$ ". Tabs **45** extending out approximately 1 " from generally circular shape of round clamp **44** provide for pivotal mating of inside tube **35** to round clamp **44**. Tabs **45** of round clamp **44** to be provided for with inside clearance **47** of approximately  $13/16$ " (see fig.2a) providing a straddle fit wherein inside surface of tabs **45** are fitted over side surfaces **40** of inside tube **35** at radius end **37**. Pivotal attachment of round clamp **44** to inside tube **35** is provided when holes **41** in side surfaces **40** of inside tube **35**

are aligned with holes **46** in tabs **45** of round clamp **44** and wherein swivel bolt **42**, having a threaded length of approximately 1 ½” is placed substantially through aligned holes **41** and **46** and secured with locking nut **43**. Locking nut **43** to be threaded onto protruding end of swivel bolt **42** and tightened to a point where round clamp **44** can be  
 5 pivoted freely on radius end **37** of inside tube **35**.

Reference **FIG. 5** Which shows anchor plate **48** mounted at a predetermined location on camper **2** providing easy and fast attachment and removal of stabilizing unit **10** to camper **2** body

Reference **FIG. 4** Which shows details of anchor plate **48** wherein anchor plate **48** is  
 10 comprised of fabricated ¼” thick metal plate approximately 1” wide and 2 ½” long having a back surface **49** , front surface **50** , a pin **51** and four countersunk mounting holes **59**. Mounting holes **59** sized and configured to accommodate approximately ¼” countersink style screws **60** for attachment of anchor plate **48** to camper **2**. Pin **51** protrudes from approximate center of front surface **50** of anchor plate **48** and is provided  
 15 to mate with hole **18** of outside tube **11** (see fig.1). Pin **51** is approximately ¾” long and machined to provide a minor diameter **52** of approximately .375” which extends outwardly approximately ½” from the center of front surface **50** of anchor plate **48**, a major diameter **53** of approximately .625” and a shoulder **54**. Major diameter **53** to extend over approximately 1/8” of pin **51** length and is provided for the purpose of  
 20 allowing pin **51** to be loosely fitted through counter bored hole **55** in plate **48** providing clearance allowing for moderate rotational movement of pin **51** without pin **51** pulling through counter bored hole **55** under load. A small thru drilled hole **56** approximately 1/8<sup>th</sup> “ in diameter is provided and positioned approximately 1/8<sup>th</sup> “ from end **57** of pin

**51.** Hole **56** provided to allow insertion of safety clip **58** insuring secure mating of stabilizer unit **10** to anchor plate **48** when hole **18** of outside tube **11** is placed over pin **51** on anchor plate **48** and clip **58** is placed through hole **56**.

Referring again to **FIG 5** to explain functional operation of stabilizer unit **10** where in  
 5 prior to offloading camper **1** from pick up truck bed or host vehicle, camper jacks **5** are lowered to the point where they support total weight of camper **1** allowing host vehicle to be driven out from under camper **1**. Camper jacks **5** are then adjusted as required to lower and level camper **1** where-in stabilizer unit **10** which has been mounted on camper jack **5** using pivotal round clamp **44** is swung away from it's stowed position **35s**  
 10 adjacent to camper jack **5** by releasing Velcro **31** on web strap **27** allowing web strap **27** to be un threaded from strap slide **30**. Locking knob **21** is then turned counter clockwise releasing pressure from end of threaded portion **22** against side **40** of inside tube **35** allowing inside tube **35** to telescopingly slide freely inside outside tube **11** allowing for length adjustment of stabilizer unit **10** necessary for mating hole **18** in outside tube **11** to  
 15 pin **51** on anchor plate **48** wherein hole **18** in back **15** of angle end **13** on outside tube **11** is placed over pin **51** of anchor plate **48** on camper face **2**. Clip **58** is then placed into small hole **56** in pin **51** insuring stabilizer unit **10** remains in positioned on anchor plate **48** until removal. Locking devise **21** is then retightened by turning knob **23** in a clockwise direction until end of threaded portion **22** of locking devise **21** makes substantial contact  
 20 with side surface **40** of inside tube **35** where in outside tube **11** and inside tube **35** define a fixed length for stabilizer unit **10** tying camper jack strut **5** to camper **1** thus providing maximum support to camper jack **5** , reducing fatigue to jack mounting **6** and increasing overall stability of camper **1** while offloaded from pick up truck or host vehicle.

While the invention here in has been described in its preferred embodiments, it is to be understood that the words which have been used are words of description rather than limitation and that changes including materials composition and basic component cross sectional shapes may be made within the preview of the appended claims without  
5 departing from the true scope and spirit of the invention in it's broader aspects.